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Development of Basketball Shooting Accuracy as Affected by Varying Goal Sizes

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DEVELOPMENT OF BASKETBALL SHOOTING ACCURACY AS AFFECTED BY VARYING GOAL SIZES

BY

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DEVELOPMENT OF BASKETBALL SHOOTING ACCURACY

AS AFFECTED BY VARYING GOAL SIZES

This thesis is approved as a creditable and independent investigation by a candidate for the degree, Master of Science, and is acceptable as meeting the thesis requirements for this degree, but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Thesis Adviser — Date

Head, Physical Education Department — Date

DEVELOPMENT OF BASKETBALL SHOOTING ACCURACY AS AFFECTED BY VARYING GOAL SIZES

Abstract

TIMOTHY BROWN FISK

Under the supervision of Associate Professor Glenn E. Robinson

The purpose of this investigation was to determine the development of basketball shooting accuracy as affected by varying goal sizes.

Thirty-seven male freshman students at South Dakota State University were divided into three experimental groups and a control group. The subjects in the experimental groups participated in a five-week training program wherein they shot baskets either at an accuracy rim, a regulation basket, or a combination of the regulation basket and the accuracy rim.

All subjects were tested at the beginning of the investigation and at the completion of the training program. Shooting accuracy consisting of 55 shots attempted at a regulation basket in both pre- and post-test from three different angles was investigated.

The data collected during the testing were recorded and analyzed statistically to determine what effect the varying goal sizes had on shooting accuracy.

The results of the findings indicated that between all four groups there was no statistically significant difference in shooting accuracy resulting from the respective training programs. Within the groups only the standard goal-accuracy rim group showed a statistically significant improvement from pre-test to post-test.

ACKNOWLEDGEMENTS

The writer wishes to express his sincere appreciation to Professor Glenn E. Robinson and Mr. William E. Fritz for their assistance throughout the course of the work reported here and the preparation of this thesis.

The writer wishes also to thank his wife Lynne for making it possible to attend graduate school.

TBF

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Chapter I

INTRODUCTION

Reasons for Study

The game of basketball could very well be the United States' greatest contribution to international athletics. Hobson[1] stated that basketball is the only major sport that is entirely American in origin. Competition in the game of basketball is now worldwide, and basketball has been played in the Olympic games since 1936.

Basketball has changed radically over the years and today is a fast moving game wherein all players have the opportunity to participate in the scoring. The very nature of the game indicates that accurate shooting plays an important role in the final outcome.

Sharman[2] stated that in basketball the team that wins scores more points than its opponent, and accurate shooting is the backbone of the game. Regardless of all the facets of the offensive and defensive strategy taking place on the court, accurate shooting is imperative if a team is to become and to remain a strong contender in games played. This view is supported by Benington and Newell,[3] who

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[1] Howard A. Hobson, Scientific Basketball, p. 3.

[2] Bill Sharman, Sharman on Basketball Shooting, p. 21

[3] John Benington and Pete Newell, Basketball Methods, p. 120.

compare shooting in basketball to playing a game of golf. These coaches believe that the golfer has a variety of shots to execute from different distances and angles and all the shots demand the same basic fundamentals of the club swing. However, the most important shot in golf is the one which puts the golf ball in the hole. This illustration has definite implications for the game of basketball. The offensive team may be fundamentally sound in all skills of play from the time it obtains possession of the ball up to the actual shot at the basket, but the end result depends upon shooting the basketball into the basket and recording the score.

It is generally agreed by the coaches, players, fans, and sports writers that accurate field goal shooting is essential for success in the game of basketball. Physical education instructors and/or basketball coaches who are interested in the success of their students or players should be interested in scientific techniques and methods for teaching accurate shooting skills.

Statement of Problem

The purpose of this study was to determine the development of basketball shooting accuracy as affected by varying goal sizes.

Limitations of Study

The study was limited to male freshman regularly enrolled in the basic instructional physical education classes at South Dakota State University, Brookings, South Dakota.

The study was limited to a five-week period of investigation. Only one basketball shooting skill, the one-hand push shot taken at distances of 15 and 20 feet, was investigated.

All subjects had earned at least one varsity letter in basketball while in high school. Subjects could not have been a member of the freshman basketball or wrestling team at the time this study was conducted.

While participants were asked not to practice basketball outside of their experimental program, it was not possible for the investigator to control the physical activity of the subjects after school hours, nor was any attempt made to regulate and standardize other daily living habits.

Definition of Terms

Shooting Accuracy. The consistency with which subjects shot the basketball through the basketball goal.

One-Hand Set Shot. Shooting style which utilizes the shooting of the ball at the basket from a set position with one hand.

Marschalk Accuracy Rim. A practice device for developing better shooting in basketball. The rim sits in a raised position above the regulation basket and is 16 inches in diameter. The regulation basket is 18 inches in diameter.

Chapter II

REVIEW OF RELATED STUDIES

Introduction

Studies relating to accuracy in field goal shooting are reported in this chapter.

Report of Pertinent Findings

Kite[4] used four equated groups of high school freshman and sophomore male students to determine the effects of variation in target size and of two methods of practice on the development of accuracy in a motor skill (one-hand push shot).

[4] Joseph C. Kite, "The Effects of Variations in Target Size and Two Methods of Practice on the Development of Accuracy in a Motor Skill," (Microcarded Dissertation, Louisiana State University, 1964).

For a four-week training period, each of the four groups practiced basket shooting at a basketball goal which was not of the same size and/or type as the goal utilized by each of the other groups.

The number of baskets a subject made on a shooting test, which consisted of 63 attempts at a regulation-size basketball goal from a distance of 18 feet and from three different angles, was considered as an index of his shooting accuracy.

While all groups recorded significant gains over initial mean scores, the results of the study indicated that no apparent advantage

is gained by practicing at a target of one particular size or type over practicing at baskets of different sizes or types.

Maaske[5] used two matched groups of freshman basketball

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[5] Paul M. Maaske, "The Effect of Practice of Shooting at Small Baskets on the Accuracy of Shooting in Basketball," (Microcarded Master's Thesis, University of Iowa City, 1960).

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players from Cornell College, Mount Vernon, Iowa, to study the effect of practice in shooting at small baskets on the accuracy in shooting at official baskets.

Daily, throughout the basketball season, the small-basket group practiced shooting at small baskets which differed from official baskets only in that the small baskets were 15 inches in diameter rather than 18 inches, and the official basket group practiced shooting at official baskets.

At the beginning and end of the testing period, the players were given a shooting test in which each player attempted, at an official basket, fifty field goals from each of nine shooting stations, a total of 450 attempts.

During each session at which basket shooting was practiced, the players were allowed 20 to 25 minutes in which to practice the shots of their choice with the stipulation that the type of shots practiced were to be used in the games. Throughout the experimental period, which spanned two seasons, a record of the shots (field goals and free throws) attempted and the shots made in all practice and inter-school games was kept for each player.

For the official-basket group, the difference between the means of the baskets made on the initial and final shooting test showed a gain of 15.39 baskets per player, while the difference for the small-basket group resulted in a mean gain of 25.85 goals per player. According to the Fisher t test, both groups made significant gain ($p = .01$) in shooting accuracy. An analysis of co-variance showed that the improvement in shooting accuracy for the small-basket group was significantly greater ($p = .05$) than the improvement in shooting accuracy for the official-basket group. Further analysis of the scores made by the two groups showed that the greatest difference in the improvement in accuracy occurred on shots taken from the stations farthest (23 feet) from the basket. Maaske felt that this result was probably a reflection of the fact that for a given angle of error, the distance by which a shot misses the center of the basket varies directly with the distance from the basket to the spot from which the shot was taken. Thus, in this study increased accuracy in shooting is more critical to success in shooting long shots than in shooting short shots.

In a study conducted at North High School, Des Moines, Iowa, Anderson[6] tried to determine whether any significant improvement was

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[6] Theresa Anderson, "A Study of the Use of Visual Aids in Basket Shooting," Research Quarterly, 1942, pp. 532-37.

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associated with the use of certain aids in visualization in the teaching of bank shots in basket shooting.

The experimental group practiced the bank shot on a backboard which was marked with spots where the ball should be aimed. The control group practiced without the aid of these spots.

Analysis of results at the close of the six-week testing period indicated that the "spot" group improved approximately 25 percent more than did the "no spot" group. The size of the critical ratios led Anderson to conclude that the difference between the groups which used visual aids and the one that did not was significant.

A study reported by Mortimer[7] attempted to analyze the

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[7] E. M. Mortimer, "Basketball Shooting," Research Quarterly, May, 1951, pp. 234-43.

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flight of a basketball by giving the student a specific shot pattern, thereby reducing the trial and error factor of learning. Mortimer operated on the theory that with a given force and direction, there is only one arc of flight that will send the ball directly through the center of the basket.

The high point of flight was determined and then a bar was suspended slightly above this height to serve as a point of aim. An initial shooting line was marked off on the floor (line 1), and another parallel line (line 2), was made to mark the end of the flight. The learning situation was an attempt to develop within the subject proper "feel" of each shot and to allow a learning situation which tended to develop a sort of kinesthetic memory of the shot.

Calculations were made of the possible angles of projection and corresponding initial velocities of a shot 12 feet from the basket.

Assuming that the angle of projection which allows for the greatest margin of error is desirable, Mortimer concluded after analysis of shot graphs that the 58° projection in communication with the velocity necessary to put the ball through the center of the basket probably allows the shooter the greatest margin for error.

A tabulation of shots by Bunn[8] indicated that more shots

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[8] John W. Bunn, Scientific Principles of Coaching, pp. 222-26.

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fall short than long. He surmised that this result was caused by the fact that most players are taught to use the nearest point of the rim as a target. As players tire they begin to fall short of this target (point of aim); therefore, one should emphasize overshooting with the use of the bankboard. Bunn related that a study on shooting at a target in the center of the basket showed that scores improved 20 percent over the scores obtained by aiming at the front rim. Another study which placed spots on the bankboard 6 inches apart and one foot above the rim of the basket showed that the players who used the spots improved faster than those who shot at an unmarked board. Those who used spots improved 10.8 percent after four weeks of practice. Those who shot without the spots improved 4.4 percent. Removing the spots later did not affect accuracy. The image had been set. This study indicated that a four-week practice period was sufficient for optimum results.

The purpose of Moffett's[9] study was to determine the use of

[9] D. C. Moffett, "A Study of Direction in Motor Skills at Different Distances as Determined by Relative Size of the Angle of Error," Research Quarterly, December, 1942, pp. 466-79.

the relative size of the angle of error as a basis of discrimination as to whether there are significant differences in accuracy of direction in certain motor skills at different distances.

One of the basketball tests involved the one-hand push shot which was attempted from distances of 10 feet, 15 feet, 20 feet, 25 feet, 30 feet and 35 feet. Prior to each practice period, subjects were permitted to warm-up with two or three practice trials, but not at the distance from which they were to start that day. Each subject completed one hundred trials at each distance.

Moffett concluded that insofar as the one-hand push shot was concerned, there is an increase in accuracy when the distance is increased from 10 feet to 15 feet. However, when the distance is increased from 15 feet to 25 and/or 30 feet, a decrease in accuracy results.

Summary

Of the six studies reviewed only two compared the effects of shooting practice involving a small basket as opposed to shooting practice involving an official basket. One of these appeared to demonstrate the superiority of the small basket group, relative to improvement in shooting accuracy, over the official-basket group, and

particularly so in shooting longer shots than shorter ones. The results of the other study showed that no apparent advantage is gained by practicing at a target of one particular size or type over practicing at baskets of different sizes or types.

Two investigators discovered that accuracy in shooting baskets was improved significantly by players who used spots on the backboard as visual aids when practicing.

One study related evidence which showed that as the distance of the shooter from the basket increases, it becomes increasingly more difficult to shoot baskets successfully.

One investigator wrote that the trial and error factor of learning to shoot successfully or accurately could be eliminated by analyzing the flight of a basketball, thereby giving the student a specific shot pattern. The investigator operated on the theory that with a given force and direction, there is only one true arc of flight that will send the ball directly through the center of the basket.

In one study which utilized a target in the center of the basket as the point of aim, it was reported that scores improved 20 percent over those scores obtained from aiming at the front rim.

Chapter III

PROCEDURE FOR OBTAINING DATA

Introduction

The subjects that were used in the experiment, the test that was used on shooting accuracy, and the procedures that were used in testing shooting accuracy are described in this chapter.

Subjects

The 37 subjects were male college freshmen at South Dakota State University, 18 and 19 years of age. These subjects came from a variety of academic and athletic backgrounds and had varying degrees of basketball shooting skill and experience even though they had won at least one high school varsity letter in basketball. All subjects were required to use the one-hand set shot method of field goal shooting. All subjects agreed voluntarily to participate in the experiment.

Measurements

The American Association of Health, Physical Education, and Recreation[10] basketball skills test was used in the measurement of shooting accuracy. Each subject was given this test (A. A. H. P. E. R.) consisting of 55 shots prior to and following the training program.

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[10] American Association for Health, Physical Education, and Recreation, Skills Test Manual-Basketball for Boys, pp. 18-23.

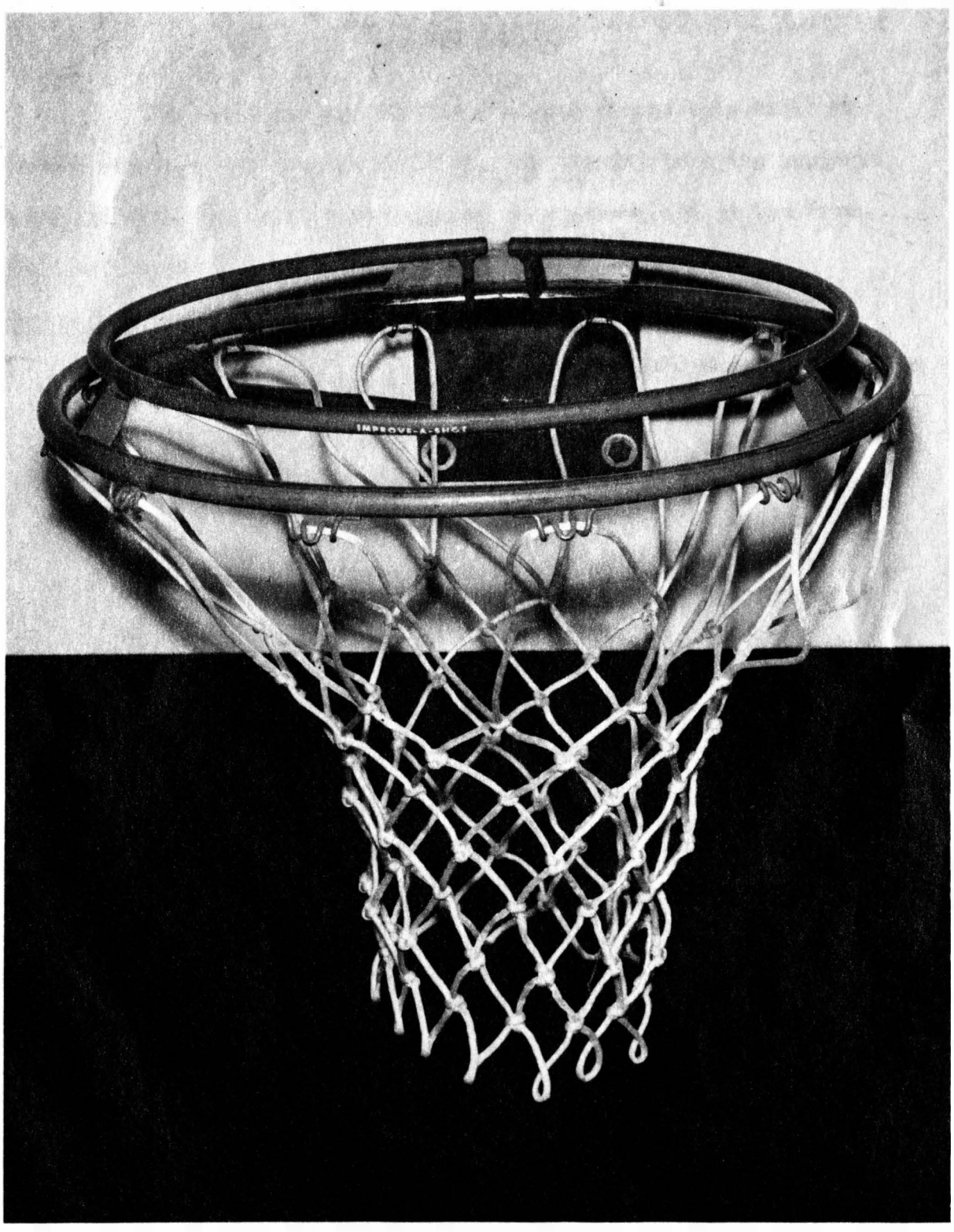
The initial and final testing periods were conducted in a one-day session.

On the day of the initial testing period each subject reported to the testing station where he was given an information sheet which contained instructions for taking the test (Appendix A). A copy of the score sheets for the initial and final test and the practice sessions are found in Appendix B. At this time the writer went over the instructions with the subjects. The general fundamentals of the one-hand set shot were discussed and demonstrated for each subject.

The final test was given in the same manner using the same score sheets and the same directions. On the final test, however, there was no discussion or demonstration as to proper shooting technique.

The original and the final tests were personally administered to the subjects by the investigator. The subjects shot all of their field goals and free throws at the same basket. Each subject was allowed one practice shot before each station of shooting.

The equipment used in this experiment consisted of three basketballs, three basketball goals located in the South Dakota State University Fieldhouse, and two Marschalk accuracy rims (Figure 1).



Marschalk Accuracy Rim

Training Program

The subjects were assigned to four groups by a table of random numbers. On the day following the initial test the subjects were informed of their group assignment as determined by the track pill box method.

Group Number	Groups
I	Standard Goal-Accuracy Rim
II	Accuracy Rim
III	Standard Goal
IV	Control

Subjects in groups I, II, III, and IV were informed that their training program would run for 20 sessions. The experimental subjects met at four weekly training sessions (Monday through Thursday) in each five weeks of training. The training program began on April 3, 1967, and was completed on May 4, 1967.

The subjects in the combination standard goal-accuracy rim group were to shoot at the standard goal on Monday and Wednesday and at the accuracy rim on Tuesday and Thursday. These subjects were instructed to shoot 55 shots from three different angles in each of the 20 training sessions. Shooting stations and scoring procedures were identical to the initial and final test as explained in Appendix A. Each subject was allowed one warm-up per station.

The subjects in the accuracy rim group were to shoot at the accuracy rim Monday through Thursday. Subjects were instructed to

shoot 55 shots in each of 20 training sessions from three different angles. Shooting stations and scoring procedures were identical to the initial and final test as explained in Appendix A.

The subjects in the standard goal group were to shoot at the standard goal Monday through Thursday. Subjects were instructed to shoot 55 shots in each of 20 training sessions from three different angles. Shooting stations and scoring procedures were identical to the initial and final test as explained in Appendix A.

At the completion of each week of the training program the mean score for each group was computed for the purpose of establishing a trend analysis (Figure 2).

The subjects in the control group participated only in the initial and final test.

The groups originally started with 10 subjects in each group; however, three subjects withdrew from the experiment due to academic difficulties. Groups I and III each completed the study with ten subjects. Group II completed the experiment with nine subjects, while group IV completed the study with eight subjects.

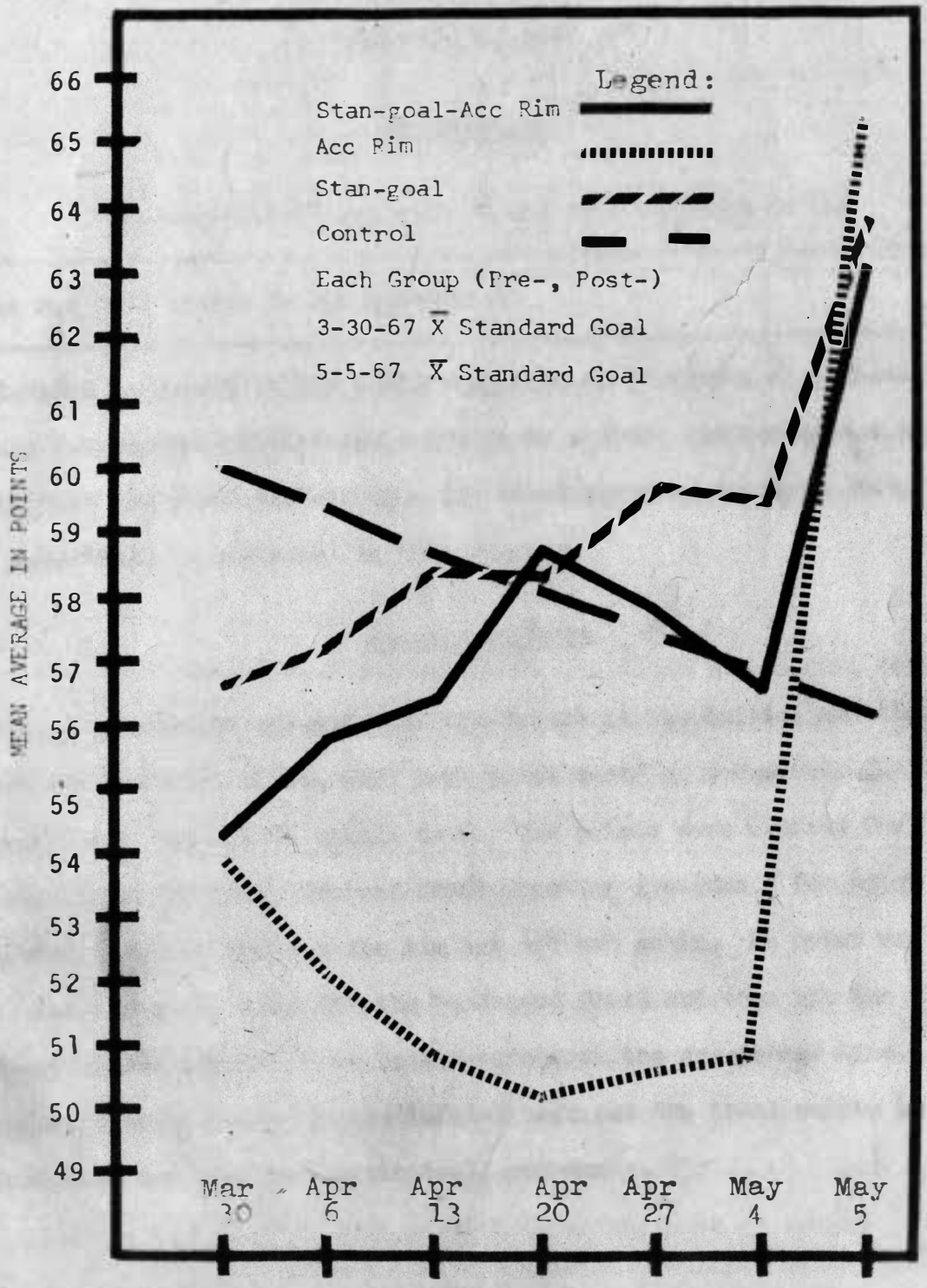


Figure 2. Trend Analysis

Chapter IV

ANALYSIS OF DATA

Introduction

The statistical analysis of the data* (scores on the A.A.H.P.E.R. sports skills test) collected on 37 freshman subjects at South Dakota State University and used to compare the variations in goal size and their effects upon the development of shooting accuracy in basketball is presented in this chapter.

* The raw data appear in the Appendixes.

Scoring of Data

Each shot attempted at the basket in the initial and final test was scored on a two, one, zero point basis as recommended by the A.A.H.P.E.R. basketball skills test. Two points were awarded for baskets made from the side and front shooting stations. One point was awarded when the ball hit the rim but did not go in. No point was allowed for shots which hit the bankboard first and then hit the rim. One point was awarded for a basket made from the free throw line. The subject's total points in the initial test and the total points in the final test was used for statistical procedures.

Reliability of Data

The test used to measure accuracy in field goal shooting was a modification of the American Association of Health, Physical Education, and Recreation[11] sports skills test for basketball. The

[11] American Association for Health, Physical Education, and Recreation, op. cit., pp. 18-23.

investigators of the A.A.H.P.E.R. test determined correlation coefficients of not less than +.70 for events scored on the basis of accuracy.

Analysis of Data

An analysis of variance technique with a one percent level of significance as described by Garrett[12] was employed in order to

[12] Henry E. Garrett, Elementary Statistics, pp. 170-176.

determine if there were any statistically significant differences between means of the experimental and control groups.

The necessary F-ratio in this study to denote statistically significant differences between the groups was 4.51 at the one percent level using three and 33 degrees of freedom.

Duncan's New Multiple-Range Test as outlined by Steel and Torrie[13] was employed to compare the following pairs of means:

[13] Robert G. Steel and James H. Torrie, Principles and Procedures of Statistics, pp. 107-109.

Group IV to Group I, Group IV to Group III, and Group IV to Group II. Duncan's New Multiple-Range Test is to be applied to group means containing equal replicates. Due to the unequal numbers in one experimental group and the control group, a procedure as outlined by Kramer[14] for unequally replicated treatments was applied. The

[14] Ibid., p. 114.

validity of Kramer's procedure has not been verified.

The protection level was 97 percent for this study since four group means were being compared, with alpha at .01. The SSR at 33 degrees of freedom for two means is 3.88, for three means is 4.05, and for four means is 4.16.

Differences within each of the four groups was analyzed by a t-test as outlined by Garrett[15] for finding the significance of the

[15] Garrett, op. cit., pp. 129-132.

difference between means obtained from the same group upon two occasions.

The t value at the one percent level of significance was chosen for this study, and the null hypothesis was applied to each group for acceptance or rejection. A t value of 3.25 with nine degrees of freedom, a t value of 3.36 with eight degrees of freedom, and a t value of 3.50 with seven degrees of freedom were necessary for rejection of the null hypothesis in this investigation.

Findings

The data from Group I, Group II, Group III, and Group IV are analyzed statistically in this section.

Between Groups

Analysis of variance was applied between the four groups to determine significance of difference between the effects of shooting for accuracy at a standard goal alternated with an accuracy rim, shooting for accuracy at an accuracy rim by itself, shooting for accuracy at a standard goal, and no shooting whatsoever as employed by Group IV.

Table I shows a summary of the analysis of variance data.

Table I

Summary of the Difference among Means by the Analysis of Variance, between Groups

Source	df	SS	MS	F-ratio
Between	3	412	137.33	2.77*
Within	33	1636.9	49.6	

*F-ratio of 4.51 necessary for significance at one percent level

In comparing the data from the differences among means, an F-ratio of 2.77 was found. This was not statistically significant for this study; therefore, the null hypothesis was accepted.

Table II shows a summary of Duncan's New Multiple-Range Test for the four groups receiving different practice methods.

Table II

Summary of Duncan's New Multiple-Range Test for the Four Groups (Post-test Means

Rank	1	2	3	4
Mean	+65.44	+63.80	+63.2	+56.25
Group	II	III	I	IV

Any two means underscored by the same line are not significantly different.

The protection level is 96 percent.

The difference in the mean gains of Groups IV and I is 6.95 in favor of Group I. Applying Kramer's procedure for unequally replicated treatments, the investigator found this difference not to be statistically significant in this study.

The difference in the mean gains of Groups IV and III is 7.55 in favor of Group III. Applying Kramer's procedure for unequally replicated treatments, the investigator found this difference not to be statistically significant in this study.

The difference in the mean gains of Groups IV and II is 9.19 in favor of group II. Applying Kramer's procedure for unequally replicated treatments, the investigator found this difference not to be statistically significant in this study.

Within Groups

Table III shows a summary of t tests for mean differences within the experimental and control groups.

Table III

Summary of t tests for Mean Difference within the Experimental and Control Groups

Group	M_f final	M_i initial	Diff. (M_f-M_i)	df	SE	t
I	63.2	54.3	+8.90	9	1.92	4.63*
II	65.44	53.9	+11.54	8	4.35	2.43**
III	63.8	56.6	+7.20	9	2.33	3.09*
IV	56.25	60.1	-3.85	7	2.66	1.47***

* t .01=3.25
** t .01=3.36
*** t .01=3.50

A mean gain of 8.90 was made within Group I between initial and final tests. The t ratio was computed and found to be 4.63, which was statistically significant beyond the one percent level. The null hypothesis was rejected.

A mean gain of 11.54 was made within Group II between initial and final tests. The t ratio was computed and found to be 2.43, which

was not statistically significant beyond the one percent level. The null hypothesis was accepted.

A mean gain of 7.20 was made within Group III between initial and final tests. The t ratio was computed and found to be 3.09, which was not statistically significant beyond the one percent level. The null hypothesis was accepted.

A mean loss of -3.85 was made within Group IV between initial and final tests. The t ratio was computed and found to be 1.47, which was not statistically significant beyond the one percent level. The null hypothesis was accepted.

Summary of Findings

In this study Group I made a statistically significant gain beyond the one percent level as indicated by the t tests for difference within groups. Groups II, III, and IV did not make statistically significant gains beyond the one percent level.

The analysis of variance test indicated no statistically significant difference between the groups at the one percent level.

Duncan's New Multiple-Range Test indicated no statistically significant difference between Groups IV and I, Groups IV and III, and Groups IV and II at the one percent level.

Discussion of Findings

The three types of practice procedure as carried on by Groups I, II, and III all appeared to be effective methods for individuals to increase their accuracy in basket shooting. However, the results obtained through the use of the t tests, seem to indicate that the standard goal-accuracy rim group, in alternating the target size from the standard goal to the accuracy rim, made more significant gains in this particular study.

It was felt by the investigator that the use of the accuracy rim by itself for a five week period with no change in target size could conceivably cause a psychological barrier to the individual who looses confidence in his shooting ability. In the writer's opinion those subjects that did practice at the accuracy rim four days a week became frustrated after the third weekly session. The reason for this frustration appeared to be lack of success in making the baskets.

Chapter V

SUMMARY

Problem

The purpose of this study was to determine the development of basketball shooting accuracy as affected by varying goal sizes.

Data

The subjects were 37 volunteer male freshman students at South Dakota State University. The subjects were divided by a table of random numbers into standard goal-accuracy rim, accuracy rim, standard goal, and control groups. The subjects in the three experimental groups participated in a five-week training program, in which they met four times a week. A training session consisted of 55 shots taken from three different angles for record. The control group took part in the initial and final test only. A test was administered prior to the training program to all four groups to determine shooting accuracy ability. A post test was administered at the termination of the program to determine the effectiveness of the training program.

The data collected during the testing period were recorded and analyzed to determine what effect the training program had upon the subjects' ability to shoot baskets accurately. In order to determine if there was any improvement within the groups a *t* test was applied to each group. The analysis of variance was employed to determine whether any of the four groups were significantly different.

Duncan's New Multiple-Range Test was then applied to compare each group mean difference with every other group mean difference to determine which groups had means that were significantly different.

Findings

The results obtained in this investigation are as follows:

1. The mean gain made by the standard goal-accuracy rim group was significant at the one percent level of confidence. The mean gains made by the accuracy rim group, the standard goal group, and the control group were not significant at the one percent level of significance.

2. The difference among the mean gains of the standard goal-accuracy rim, accuracy rim, standard goal, and control groups was not significant at the one percent level of significance.

Conclusions

The findings in this study would appear to warrant the conclusion that the form of practice employed by the standard goal-accuracy rim group is effective in increasing shooting accuracy.

This investigation also indicated that there was no significant difference in improvement between the groups.

The trend analysis (Figure 2) indicated that Group I reached its peak mean performance at the termination of the third weekly training session. This fact may have some implications concerning the usage of this practice method for only three weeks. The trend analysis

indicated that Group II reached its peak mean performance at the termination of the first weekly training session. This fact may have some implications concerning the usage of this practice method for one week intervals. The trend analysis indicated that Group III reached its peak mean performance at the termination of the fifth weekly training session. This fact may have some implications concerning the usage of this method for basketball coaches in planning five week pre-season shooting drills.

Recommendations for Further Study

1. That a similar study be conducted wherein the total number of shots and shooting stations would be increased.

2. That a similar study be conducted to investigate the results of a shooting accuracy program wherein the distances of the shooting stations from the basket would increase.

3. That a similar study using the same experimental design but with college varsity basketball players who have attained a higher basket shooting skill level as subjects to investigate whether the same effects would be found.

APPENDIXES

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Appendix A

INSTRUCTIONS FOR TAKING INITIAL AND FINAL TEST

INSTRUCTIONS

You will shoot 55 shots at the basket in the following manner: 10 shots each from the right and left corner of the court, 20 feet from the basket; 15 shots from the left front of the basket just outside of the free throw circle where the free throw line intersects the circle; and 20 free throws from the free throw line.

SCORING FOR FRONT SHOT

Two points will be counted for each basket made, regardless of how the ball goes in. One point will be counted for shots which hit the rim but do not go in the basket, provided the ball hits the rim before hitting the backboard. Balls which hit the backboard first and do not go in the basket do not count any points. Points will be recorded on each shot, and then totaled for the final score. The maximum score that may be made for the 15 shots is 30 points.

SCORING FOR SIDE SHOTS

Two points will be counted for each goal made and one point counted for balls which hit the rim of the basket but do not go in, even though they may have hit the backboard first. Each shot will be scored as made and then the points will be totaled for a final score. The maximum score is 40 points on the 20 shots.

Appendix A (continued)

INSTRUCTIONS FOR TAKING INITIAL AND FINAL TEST

SCORING FOR FOUL SHOTS

One point will be scored for each goal made regardless of how the ball goes in. Each shot will be counted as one or zero, and the points recorded. The maximum possible score is 20 points.

Appendix B

SCORE SHEET FOR INITIAL AND FINAL TEST,
AND PRACTICE SESSIONS

Name _____

Group _____

SIDE LEFT

1._____ 6._____
2._____ 7._____
3._____ 8._____
4._____ 9._____
5._____ 10._____

SIDE RIGHT

1._____ 6._____
2._____ 7._____
3._____ 8._____
4._____ 9._____
5._____ 10._____

FRONT SHOT

1._____ 6._____ 11._____
2._____ 7._____ 12._____
3._____ 8._____ 13._____
4._____ 9._____ 14._____
5._____ 10._____ 15._____

FOUL SHOT

1._____ 6._____ 11._____ 16._____
2._____ 7._____ 12._____ 17._____
3._____ 8._____ 13._____ 18._____
4._____ 9._____ 14._____ 19._____
5._____ 10._____ 15._____ 20._____

Appendix C

RAW SCORES

Standard Goal-Accuracy Rim Group

Subject	Initial	Final
1	57	60
2	54	67
3	57	59
4	54	67
5	52	70
6	44	46
7	59	72
8	56	61
9	52	67
10	58	63

Accuracy Rim Group

1	64	62
2	57	57
3	31	60
4	71	66
5	47	73
6	54	64
7	37	68
8	61	61
9	63	78

Standard Goal Group

1	60	66
2	63	66
3	47	63
4	58	67
5	59	68
6	47	56
7	48	59
8	64	54
9	67	71
10	53	68

Appendix C (continued)

RAW SCORES

Control Group

Subject	Initial	Final
1	64	59
2	55	47
3	65	56
4	58	67
5	55	57
6	76	61
7	47	41
8	61	62